Group 2: Biosensors

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Current capabilities:

Two component signal transduction
Periplasmic binding proteins
RNA aptamers/riboswitches

	Mission ideas:	Needed capabilities	Required research & technology development.
5 years			
15 years			
30 years			
> 30 years			

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Current capabilities:

- Two component signal transduction: ions, peptides, molecules, etc
- Periplasmic binding proteins, olfactory sensors: not easy to change target if it doesn't exist in nature (comp bio comes in)
- RNA (riboswitches), DNA aptamers, combinatorial, logics, temperature sensing with RNA folding
- Life detection: universal molecules (ATP, LPS)

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	Mission ideas	Needed capabilities	Required research & technology development
5 years	1. Human missions on ISS 2. Robotic missions on near solar system 3. What machines can't discriminate	Radiation bio-sensors, secondary payloads, Biology in non-earth environment (things don't work in the same way in space)	natural organisms behave in space, identify what we want to sense and what is possible to sense (radiation, stress, damage) then figure out what we have in our toolbox, development of signal input/outputs

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	Mission ideas	Needed capabilities	Required research & technology development
15 years	Experiments on moon and high earth orbits (sustainability) ,auxotroph, adaptation of sensors		Consortium monitoring (multiple generations or ~900 days), simulate various gravity by centrifuge, what can live on moon

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	Mission ideas	Needed capabilities	Required research & technology development
30 years			

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	Mission ideas	Needed capabilities	Required research & technology development
> 30 years	1. Multi-detection(hv, O2, toxic stuff) 2.early warning detection on buildings/ ships 3. Dynamic self modifying (self-adopt/ repair/learning) system: detect and response 4. implantable sensors	Genetic stability	